

November 17, 2020

# 505 WEST CHAPEL HILL ST EXISTING BUILDING ANALYSIS

REPORT PREPARED FOR



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# INTRODUCTION

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## LOCATION

The subject site is located on a 4.103 acre parcel in downtown Durham, North Carolina south of West Chapel Hill Street and north of Jackson Street. The parcel is bound by South Gregson Street to the west and South Duke Street to the east. The site is in close proximity to entrance and exit ramps for the Durham Freeway (NC-147).

The parcel ID number is 114577 and is currently zoned as DD-C (D). The subject site is in a mixed-use urban environment, adjacent to Duke Memorial United Methodist Church to the north and the recently renovated North Carolina Mutual Life Insurance Building to the east. Multi-residential developments are located to the west and south of the site.

The subject site was unoccupied at the time of inspection. The building served as the Durham Police Headquarters from 1991 to 2018.

## History

Preservation Durham and North Carolina Modernist Houses petitioned the city last year to preserve the old Durham Police Headquarters building. According to North Carolina Modernist Houses, architect George Milton Small Jr. designed it in 1956 as the Home Security Life building. The modernist office building was the home of a local insurance company, founded by prominent banker and philanthropist John Sprunt Hill (1869-1961).



Home Security Life Building (early 1960's), Archival Photographs from NC Modernist Website

Completed in 1959, the building occupies a prominent site on the corner of Chapel Hill Street and Duke Street, replacing a small gas and service station from the early 1950's. Prior to the gas station, two large homes sat on the site. In the early 1900's, the surrounding blocks of the site made up a wealthy residential neighborhood just west of downtown. The site is one of the highest vantage points in downtown Durham. The building is considered the first Miesian skyscraper in North Carolina and received an NC AIA award in 1959. Tall ceilings and an open floor plan are hallmark features of Small's design. Despite its rich history, the building does not hold status as a historic landmark.



Home Security Life Building (early 1960's), Archival Photographs from NC Modernist Website

## ASSUMPTIONS

The following includes assumptions that have been made relative to the current and future use of the building. It also includes work performed by others and not part of this analysis:

1. The drawings produced by Duda|Paine and the Consultant team are based on the existing building drawings. Detailed field measuring was not performed. Specific critical areas will be field measured at the commencement of design services.
2. The team was not able to enter all spaces within the building during the time of the analysis. All spaces will need to be accessible at commencement of design services for the project.
3. It is understood that the Owner will be performing Geotechnical exploration of the site including portions of the site around the existing building. This information will provide a greater understanding of the bearing capacity and seismic site classification of the current site which will be required for the beginning of design for the project.
4. The Owner has engaged separately an environmental services firm to confirm the existence of hazardous materials in the building including asbestos and lead paint. While materials that were designated as containing asbestos in previous environmental reports were observed by the team, we have not provided the extent and type of hazardous materials that may be present.
5. The site subsurface conditions, existing utilities, potential brownfield designation, contaminated soils or other site related conditions are not included within the scope of this analysis.
6. Items that will need to be confirmed at the beginning of design include available fire hydrant flow tests, fire flow analysis, confirmation of utility sizing for phase 1 and 2 infrastructure needs among others.
7. Code specific assumptions include:
  - a. The building is being evaluated under the North Carolina Existing Building Code (NCEBC).
  - b. The project work area is expected to exceed 50% of the building and will be considered an Alteration Level 3 under the NCEBC. This will require compliance with NCEBC Chapter 7,8 & 9 Alterations Level 1,2 &3.
  - c. There may be a small addition to the ground floor to allow for additional retail use. If included, this would require compliance with NCEBC Chapter 11 Additions.

- d. The ground floor retail, which could include mercantile and/or restaurant use, would require a change of occupancy from the previous Business Occupancy. This will require compliance with NCEBC Chapter 10 Change of Occupancy.

## METHODOLOGY

### Documents Referenced

- Phase 1 Environmental Site Assessment Report – Durham Police Department; MidAtlantic Engineering and Environmental Solutions (January 10, 2017)
- Limited Phase 2 Site Assessment Report Durham Police Headquarters (June 22, 2017)
- Exterior Wall Evaluation Report Prepared for Police Headquarters: David M. Crapps (May 31, 2012)
- Scans of original drawing set: Police HQ 1956 - Home Security Life Insurance; Small & Boaz (November 7, 1956)
- Scans of drawing set: Durham Police Headquarters - Home Security Life Insurance; The Freelon Group (April 24, 1991)
- Durham Police Headquarters Main Lobby Security Renovation, and Police Records Phase 1 – Division of Criminal Information/Warrant Control and Telephone Response Unit – Renovations; Roughton Nickelson De Luca Architects, PA (May 3, 2006)
- Downtown Renovation Projects City of Durham – Police Headquarters; HEERY International, Inc. (February 25, 2010)
- Selected pages of the drawing set City of Durham Downtown Renovations – Police Headquarters HVAC Upgrades Project; Engineered Designs Inc. (May 11, 2012)
- City of Durham Police Headquarters Exterior Wall Repairs; Joe P. Hill (June 24, 2014)
- Development Plan - Existing Conditions Plan; Stewart Design (January 27, 2020)
- Hazardous Materials Survey-Asbestos Analysis; Matrix Health & Safety Consultants, L.L.C. (March 30, 2020)

# ARCHITECTURAL ANALYSIS



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## BUILDING OBSERVATIONS

505 West Chapel Hill Street was once an elegantly designed modernist building with an open floor plan and tall lobby ceiling. A shallow floor plate and floor to ceiling glass curtain wall provided natural light to the majority of the building. When built in 1956, the building stood in stark contrast to other office buildings because of its forward-looking design. Unfortunately, the original design intention of the building has been lost due to numerous alterations and a significant change of use.

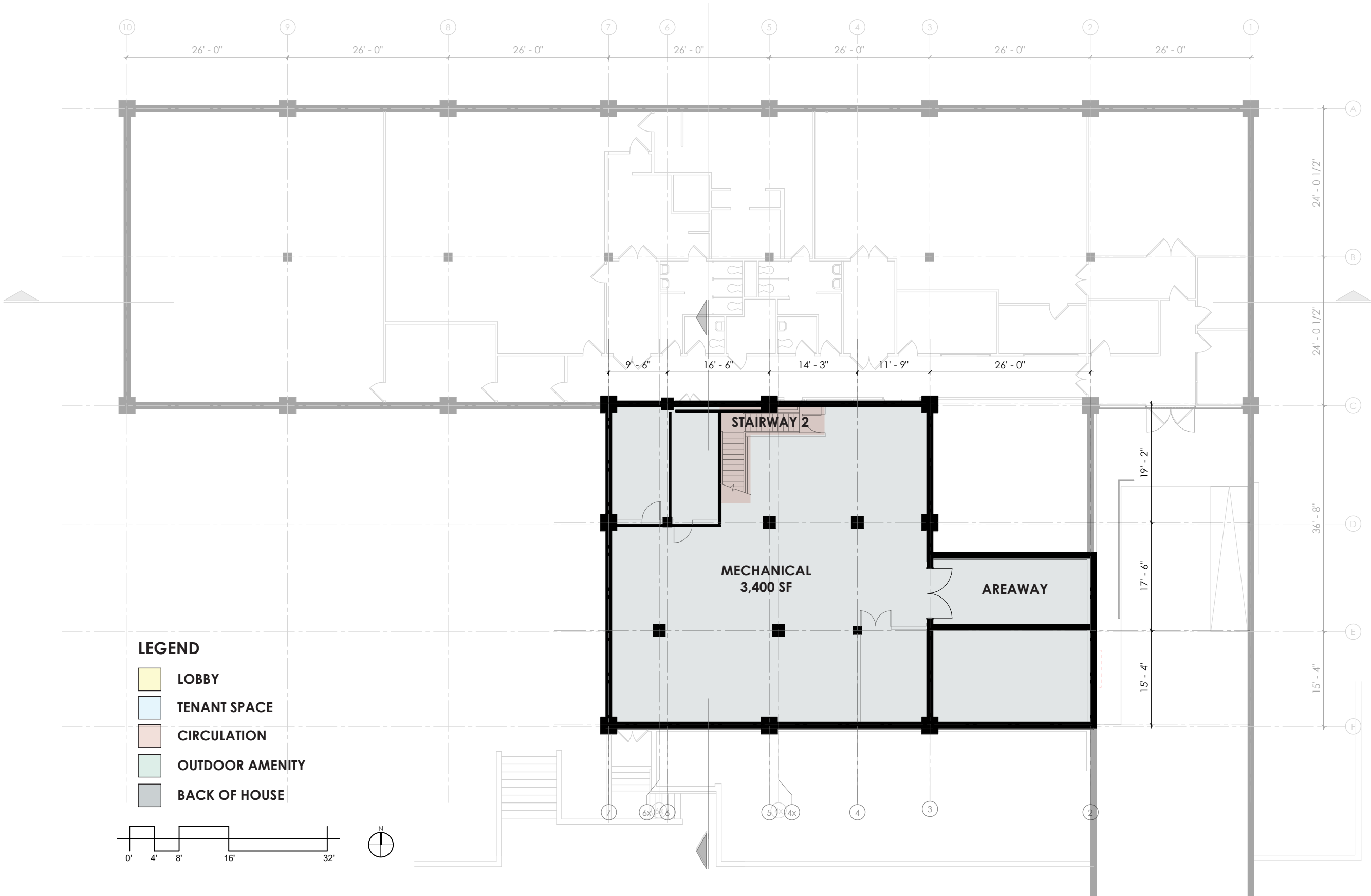


Google Earth Street View (Above), Typical Office Environment and Condition of the Building (Below)

At 64 years old, the building's condition has deteriorated. The last significant study of the building was the exterior in 2012. A lack of moisture management has had significant impacts on the building's facades. Concerning the building interior, code mandated egress requirements are the key consideration driving future design considerations and once the interior partitions are removed, much of the building's original key features will no longer have to be imagined.

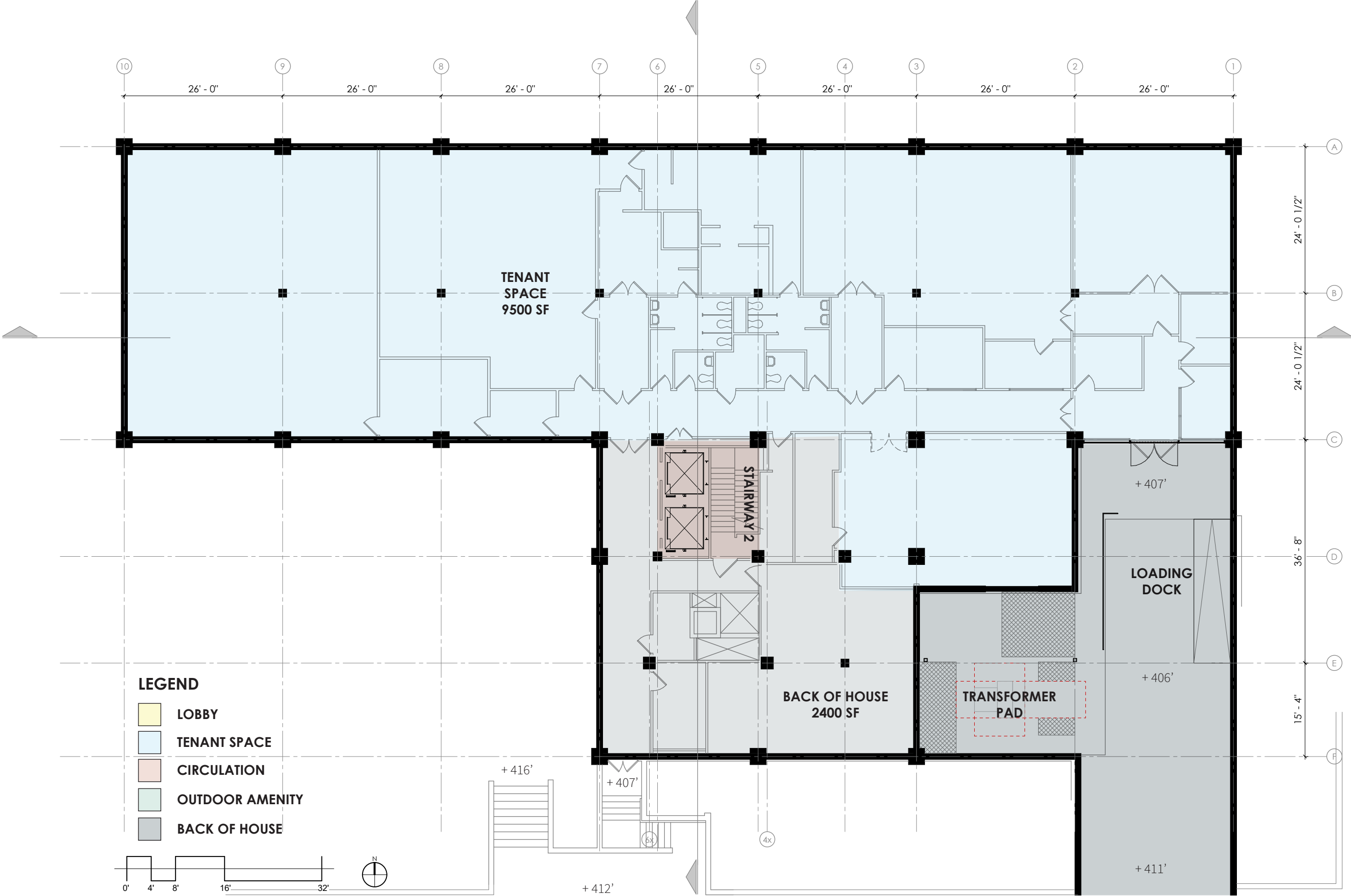






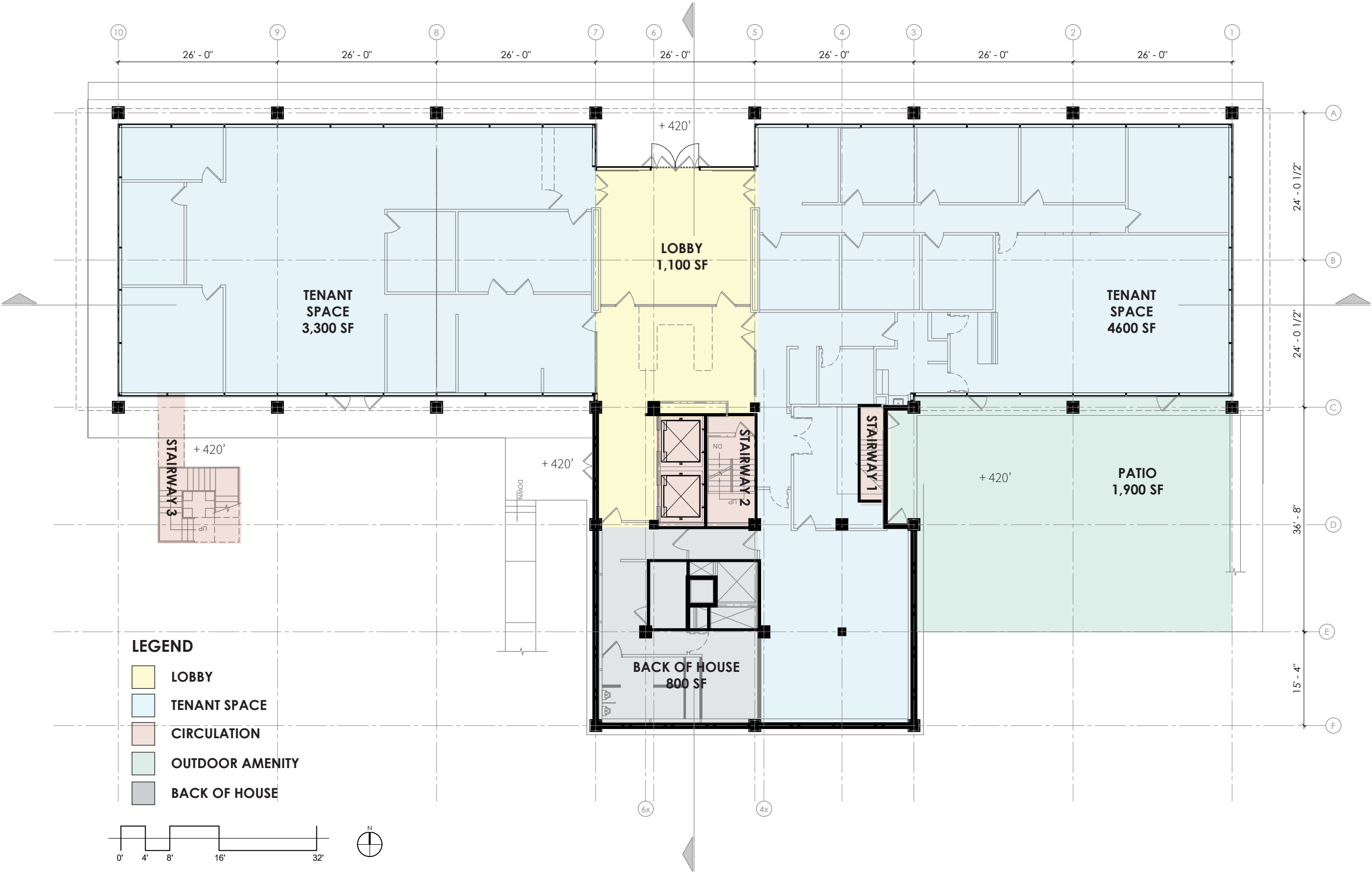
FLOOR PLAN - SUB BASEMENT

All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.



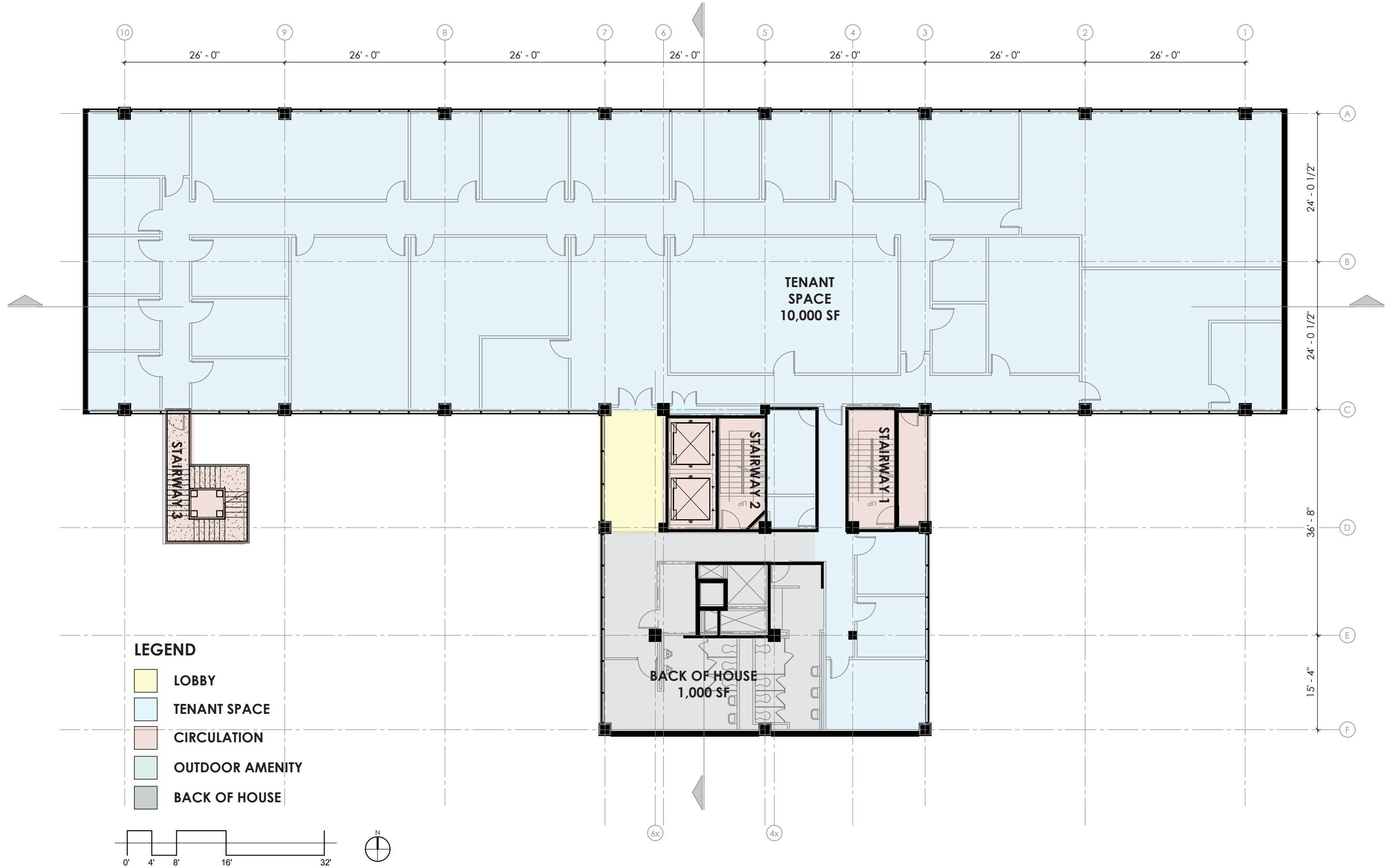
FLOOR PLAN - BASEMENT

All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.



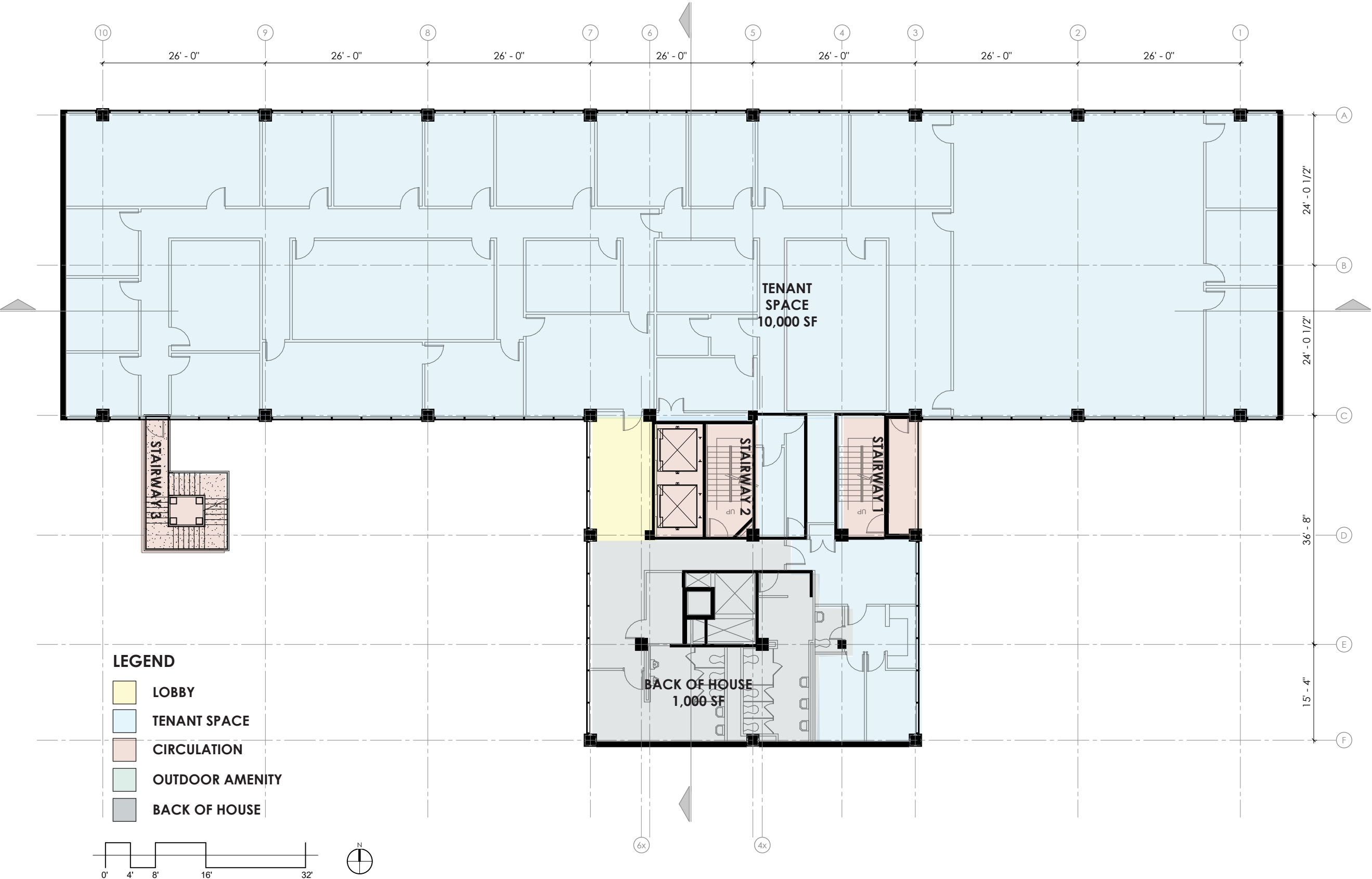
FLOOR PLAN - LEVEL 1

All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.



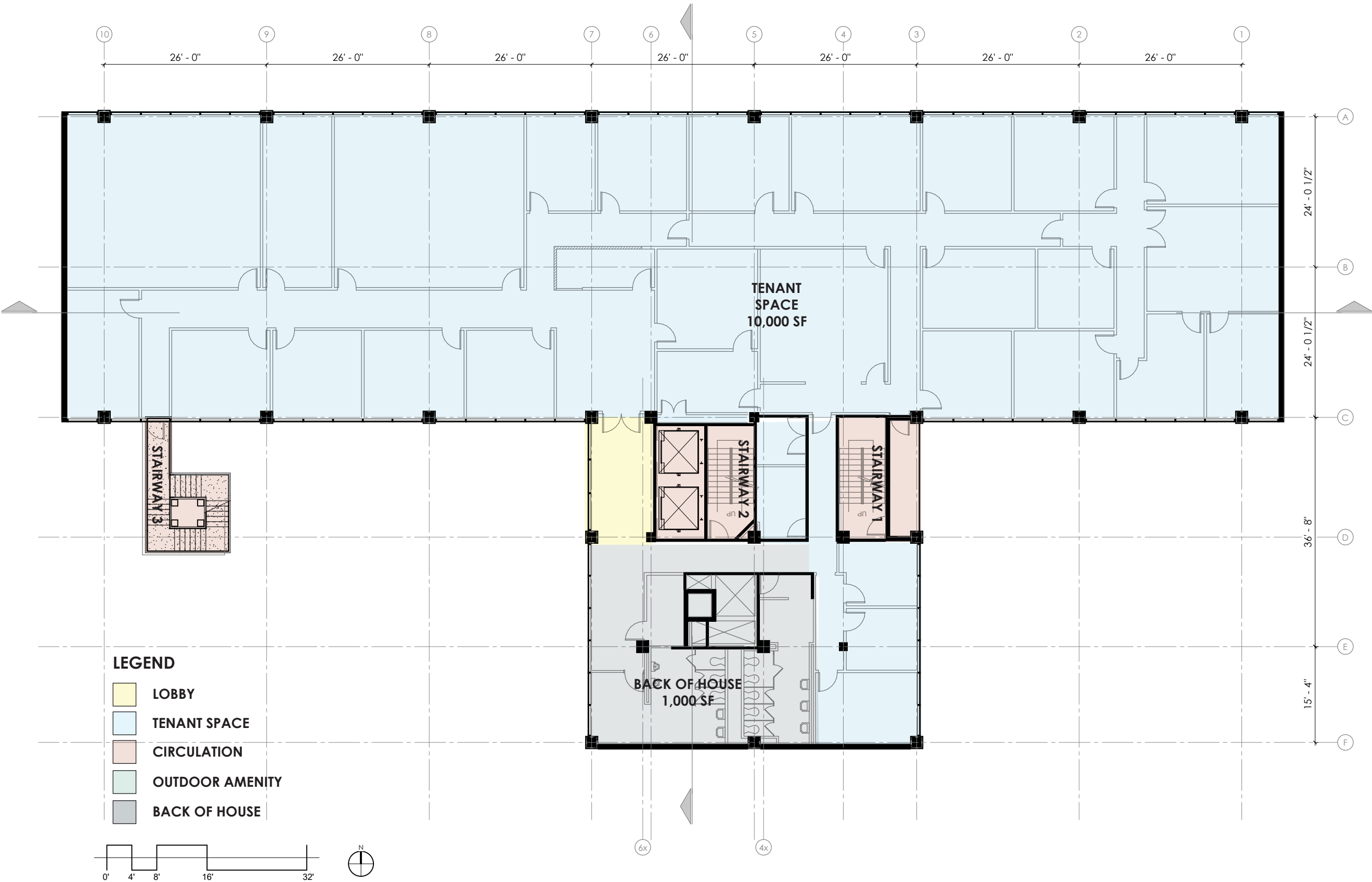
FLOOR PLAN - LEVEL 2

All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.



FLOOR PLAN - LEVEL 3

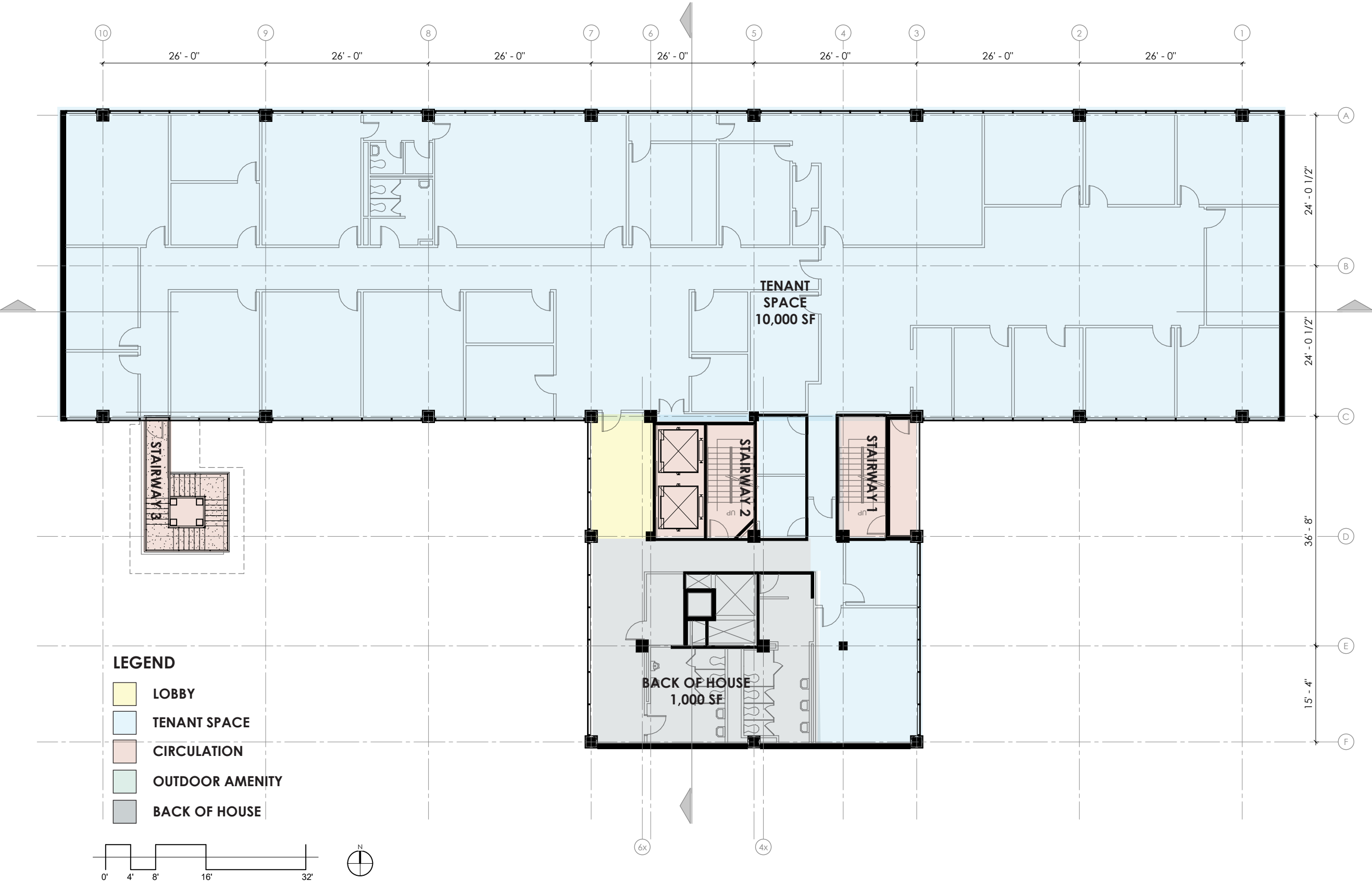
All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.



FLOOR PLAN - LEVEL 4

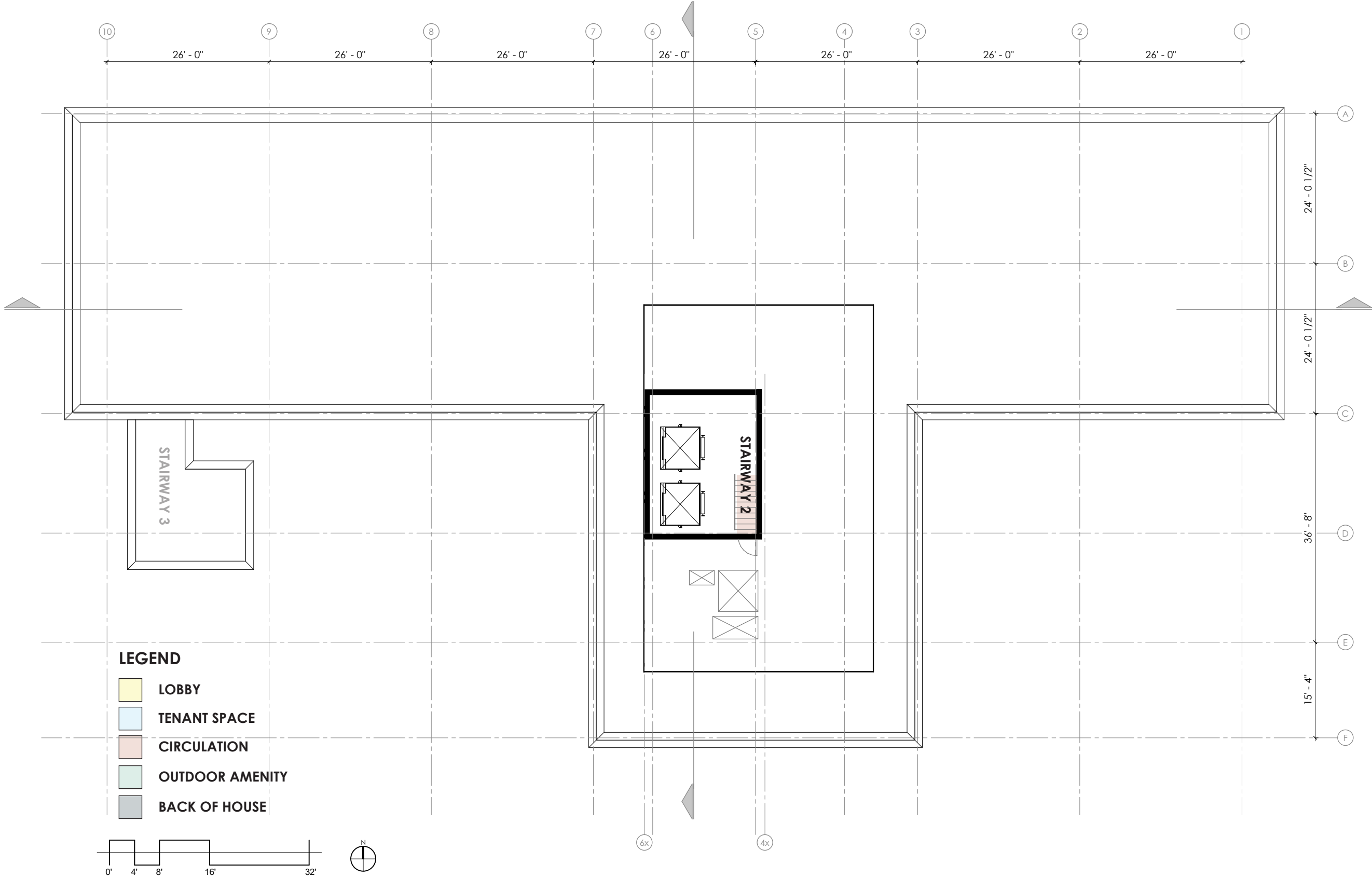
All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.





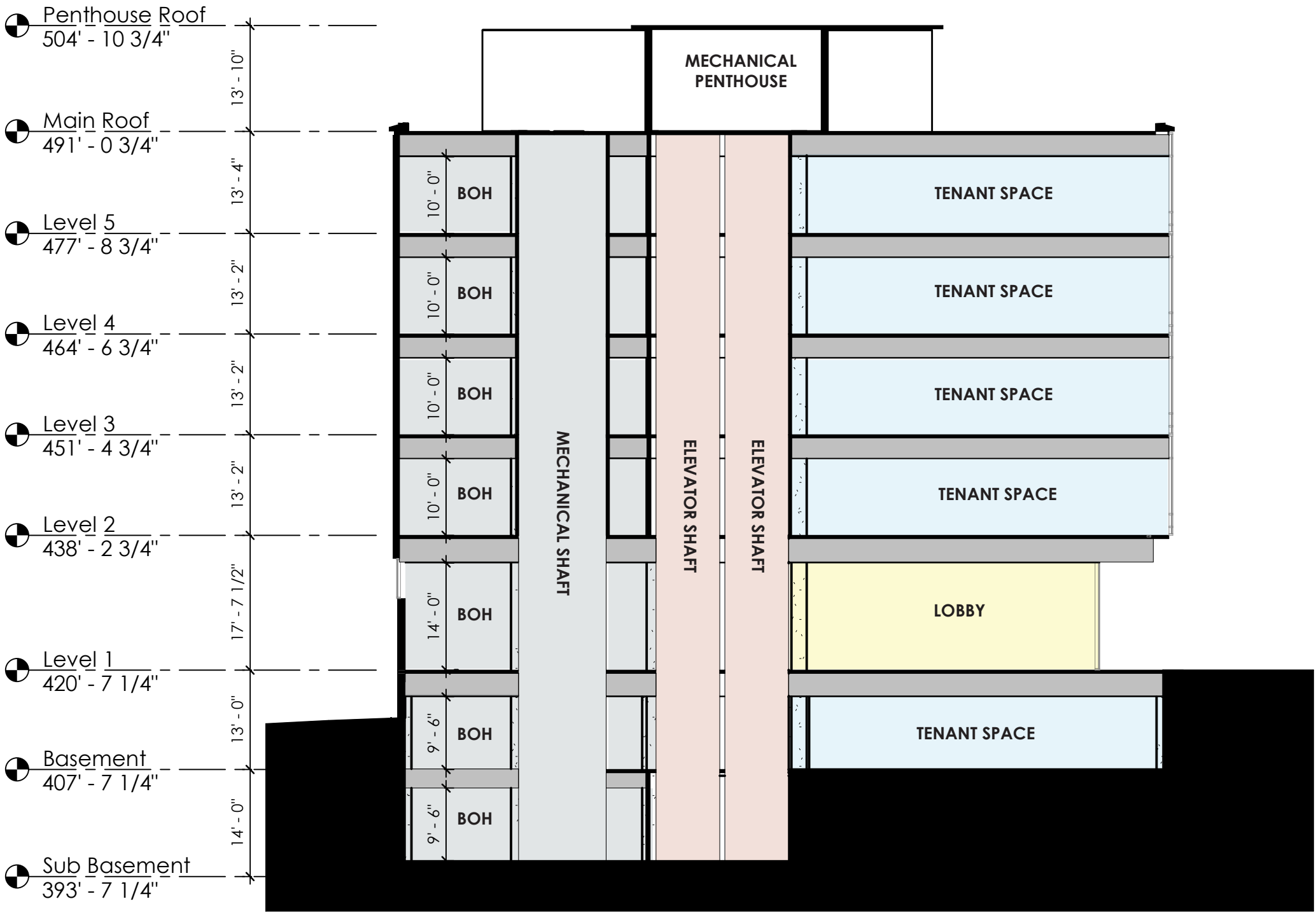
FLOOR PLAN - LEVEL 5

All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.

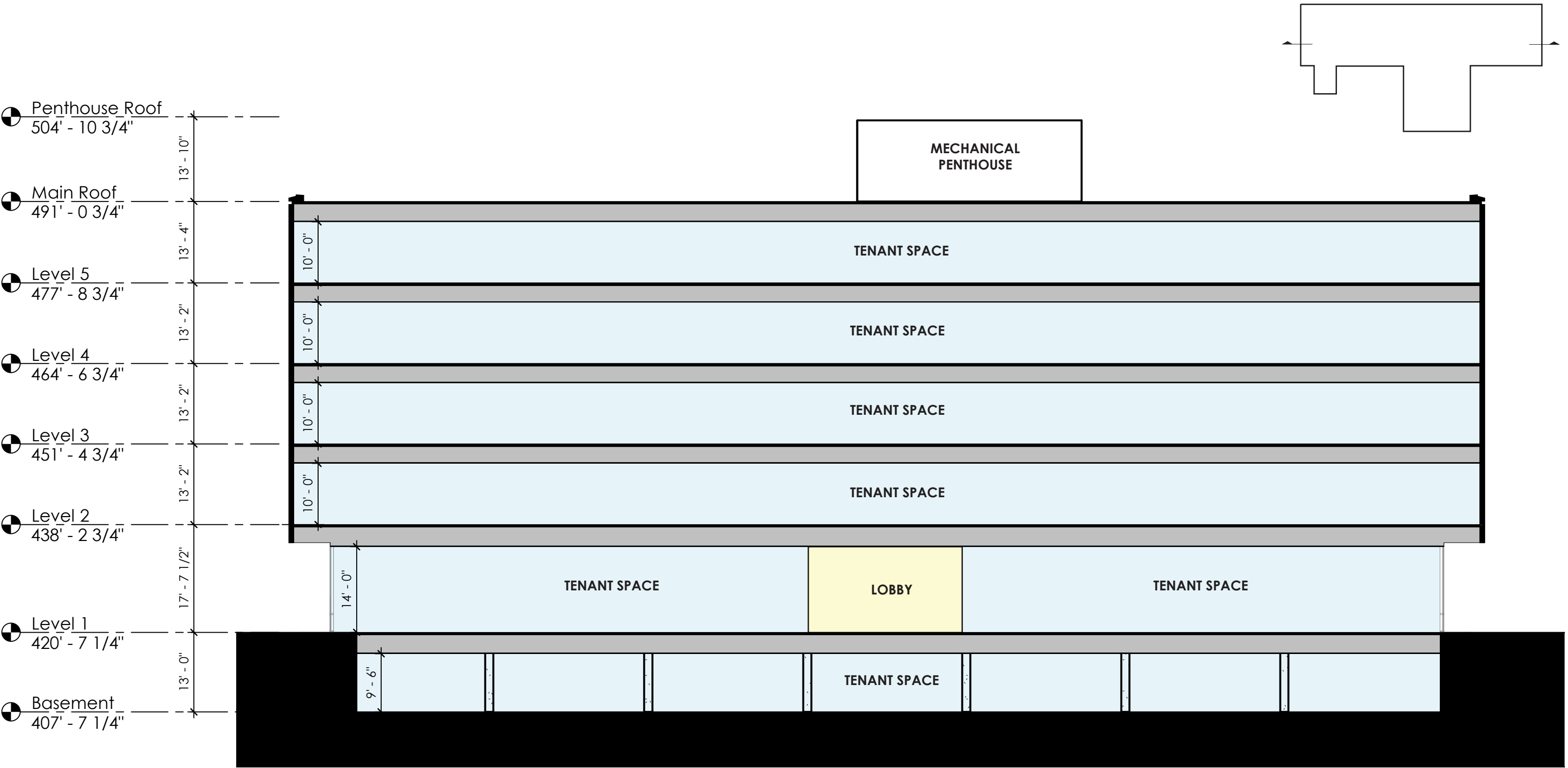


FLOOR PLAN - ROOF

All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.



All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.



SECTION - EAST TO WEST

All drawings were created based on the existing building plans.  
A detailed measurement of the existing building was not performed.

## BUILDING EXTERIOR

### Curtain Wall

The building's curtain wall has a combination of tinted and annealed non-insulated glass with aluminum mullions for the second to fifth level curtain walls. None of the glass on the building meets current safety glass specifications. The ground level has a similar curtain wall system recessed from the building edge and supported by the floor slab. Sliding aluminum sunscreens over the curtain wall were replaced during the 1991 renovation and are mechanically fastened to the exterior mullion caps. Color fading has occurred from long-term exposure to sunlight, especially at the blue spandrel panels. The condition of the existing window film is poor. According to the Exterior Wall Evaluation Report, the building sealants have generally exceeded their useful service life and merit replacement. There is visible rusting of exposed fasteners that is causing streaks along the mullions. Additionally, the building's heating system is mechanically attached to the curtain wall framing. Removal of the mechanical system may reveal additional concerns.



North Facing Exterior Curtain Wall (Left) South Facing Sun Screens (Right)

Adding insulated and low-e glazing to the existing aluminum framing would require the entire assembly to be improved in order to meet current energy codes. The current enclosure has low comfort due to air leakage and poor thermal performance would be expected and is consistent with the findings of the existing exterior

wall evaluation report. The existing facade is far from meeting current energy conservation code requirements.

**Recommendation:** Full replacement of the existing curtain wall system will be necessary to meet recommended performance, human comfort and minimum safety precautions for the building. We recommend a thermally broken curtain wall with high performance low-e insulated glazing and safety glazing where required by code. Keeping the mullion pattern of the new system similar to the existing curtain wall would allow the facade to maintain visual continuity with the original design.

### Brick Cavity Wall

The existing double wythe brick wall on the east, west, and south facades were thoroughly examined in the Exterior Wall Evaluation Report, dated 5/31/2011. Continued deterioration of the brick shelf anchors has occurred since the report was originally written. Specifically, a major failure of the south brick facade and temporary repair with painted fiber cement panels. Additional brick failures will likely continue due to continued lack of moisture management and decision to not reinforce existing brick ledges as recommended in the report. Concerning building energy performance, the existing walls provide negligible thermal insulating value for the building as currently constructed.



Painted Fiber Cement Panels installed in bottom right-hand corner where brick failure occurred

**Recommendation:** Remove existing brick cavity wall due to continued failures. If the wall is determined to remain, additional brick ledge anchors as recommended in the Exterior Wall

Evaluation Report should be provided and replacement of ledges where necessary. Interior insulation (R-10 minimum) would be recommended on the interior to mitigate thermal transfer.

### Manufactured Stone Clad Columns

The exterior stone cladding on the columns is a manufactured product called Granux. Many of the panels show signs of temporary repairs using exposed through bolts to secure the panels to the structural columns as documented in the Exterior Wall Repairs as-built drawings, dated 6/24/2014. These repairs were recommended in the Exterior Wall Evaluation Report, dated 5/31/2011.



Previous Repair with Through-Bolt Fasteners

According to the report, the joint sealant material along the panel edges has well exceeded its service life and has left the joints vulnerable to water intrusion. Excess water accumulation inside the wall cavity has accelerated the corrosion activities of the support anchors, in particular, the shelf angles and attachment bolts. We observed the stone panels at the columns around the exterior and the open gaps and misalignment which is consistent with the previous building enclosure evaluation that represents the failing structural support.





Displaced Granite Cladding at Column and Loading Dock

**Recommendation:** Remove granite cladding due to continued corrosion of shelf angle and attachment bolts, and visible temporary repairs. Replace with an alternate cladding material and properly secured to the building.

### Exterior Stairway 3

Stairway 3 is an exterior concrete-filled steel pan stair constructed in 1991 to serve as a second means of egress for Levels 2-5. The stairway currently does not meet current building code for maximum riser height, minimum riser run, or guard height. The stair has become unsafe due to exterior exposure to the elements and should be considered a hazard due to excessive corrosion of the metal pan, railing, and steel support framing.



Exterior Stairway Corrosion

**Recommendation:** This stair, including concrete footing and roof covering should be removed and replaced with a new enclosed stairway to serve Levels 2-5 as the second required means of egress. The reconstructed stairway should also be designed to access the basement level and provide a code required second means of egress allowing flexibility and full utilization of the space. See Interior Axon Diagram.

### Plaster & Lathe

The existing lathe and plaster soffits, column wraps and base finish are showing damage from water intrusion and subsequent corrosion of the metal lathe.



Lathe and Plaster Failure at Base (Left) and Soffit (Right)

**Recommendation:** Replace existing lathe and plaster surfaces with alternate material where appropriate.

### Balcony Guardrail

Stairway 1 is accessed from the building interior by an exterior balcony on the east facade. Repairs were made in 2014 to the balcony railing at Levels 2-5 due to significant corrosion and life safety concerns. However, the repair was not a permanent solution to the damage being caused by continued exposure of the steel components to moisture. Further investigation is needed to determine the structural integrity.





Google Earth Street View from Duke Street (Left), Exterior Balconies

**Recommendation:** Remove balcony guardrails and infill existing Stairway 1 and balcony in order to add additional leasable space. See Interior and Exterior Axon diagram.

### Mechanical Screen Wall

The mechanical screen wall appears to be in fair condition. It has a large operable sliding door on the west facade. Peeling and fading of the existing panels is extensive, however the integrity of the steel framing appears to be in good condition. The screenwall currently does not fully conceal the cooling tower.



Exterior and Interior of Mechanical Screen Wall

**Recommendation:** Reclad existing screen wall cladding. Remove the communication tower and equipment. Depending on the size, position and height of the new equipment, cladding will be configured to screen all equipment.

## Roofing

The existing single-ply membrane roof is showing considerable wear with a large amount of patching. Several areas of ponding due to lack of code minimum slope is apparent. The condition of the roof insulation is unknown, but soft areas of the roof were observed which may indicate water absorption due to leaks. Current perimeter parapet design is approximately 3" above the height of the roof surface making the addition of increased insulation challenging without replacement of perimeter coping.



Ponding of existing low slope roof and 3 inch perimeter coping.

**Recommendation:** Replace existing roof with new roof assembly providing  $\frac{1}{4}$ " slope with 20 year warranty, minimum. Replace perimeter coping.

## Penthouse Enclosure

The penthouse includes a reinforced concrete frame that appears to be in fair to good condition. The existing brick walls have several holes and/or penetrations that are either open or have not been properly sealed. Numerous, minor spalls were found along the surface of the concrete ceiling, and these may be due to previous hanger attachments.





Unsealed openings and penetrations in masonry.

**Recommendation:** Repair holes in existing brick walls and seal penetrations to increase water tightness.

### Loading Deck

The loading dock has two bays and a 48 inch high dock for unloading. Access to a grate covered area way and transformer pad are accessed through the loading dock. The dock is partially covered by a terrace area above. A planter box bordering the south edge of the terrace acting as a guardrail. Several granite panels at the planter box were found to be loose or displaced. Two exterior steel columns provide support for the overhead framing for the terrace. These are encapsulated by metal lathe and plaster that has been severely damaged from impact and the long-term corrosion of the lathe. There is also moderate corrosion of the tube steel. The plaster and lathe should be removed from the columns to allow them to be cleaned of rust for further inspection.



Loading Dock with Terrace

**Recommendation:** Refer to structural analysis for comments on the condition of the terrace structure. Repairs to the terrace planter box are required for safety purposes. Further drainage analysis will be required to limit flooding of sub-basement.

## BUILDING INTERIOR

### Interior Stairway 1

Stairway 1 is a cast-in-place concrete stair that connects Level 1 through 5. The stairway does not extend to the roof, basement, or sub-basement levels. It is accessed from each floor by an exterior balcony. The stairway does not meet current building code for maximum riser height or minimum riser run. Current handrails do not meet guard or handrail code requirements. The limited travel distance separating Stairway 1 and Stairway 2 makes this stairway unhelpful as a required second means of egress and is the reason why Exterior Stairway 3 was constructed during the 1991 renovation.

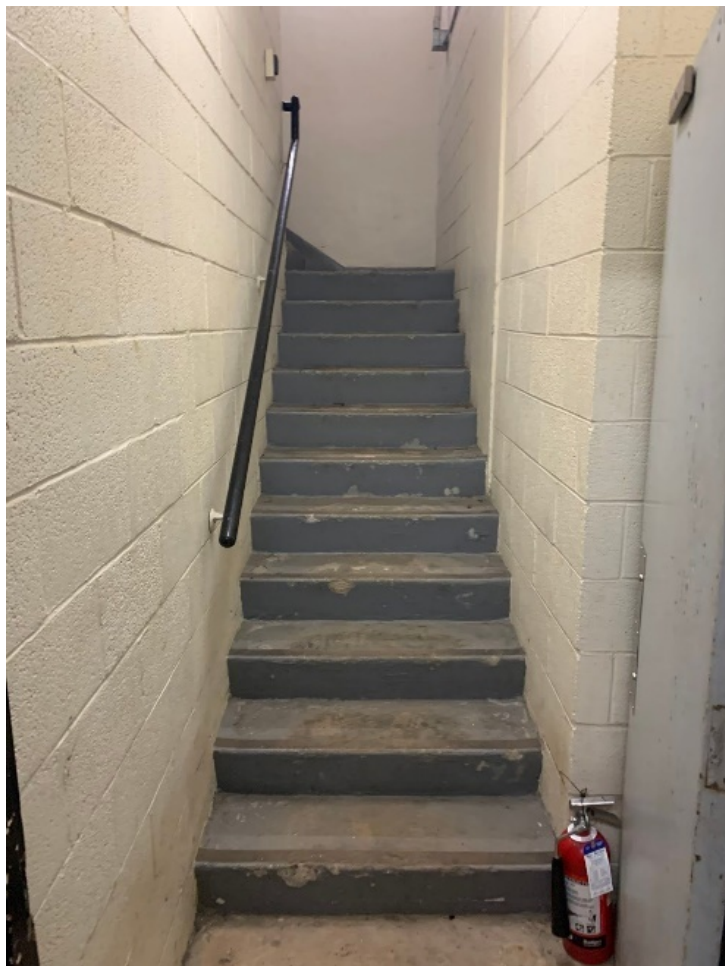
**Recommendation:** The space could be better utilized as vertical mechanical shaft space, service elevator, and/or additional leasable square footage. Demolition would be required to remove the existing concrete stair runs. A new 2-HR floor assembly and exterior wall cladding would need to be installed to gain leasable square footage. See Interior Axon Diagram.



## Interior Stairway 2

Stairway 2 is a partially cast-in-place concrete and steel pan stair. The lower concrete portion of the stair extends from Level 1 and serves the basement and sub-basement levels. The steel portion serves Levels 2-5 and extends to the roof penthouse. The steel portion of the stair does not meet current building code maximum riser height or minimum riser run. Current handrails do not meet guard or handrail code requirements. Some door swings may need to be reversed to swing in the direction of egress travel.

**Recommendation:** This stair should remain and be utilized as one of two required egress stairs serving the building. The Existing Building Code allows the project to keep the existing stairs despite the riser/run dimensions not meeting current code. While not code required under the existing building code, we recommend replacing the guardrail and handrail assemblies with current code compliant railing for safety.



## Elevators 1 and 2

The building contains two center opening 3,000 lbs traction elevators that serve Basement through Level 5. The elevator pit is located within the sub-basement level. The traction elevators are rated at 300 fpm which will provide a high level of service for future office levels. The elevator cabs and machines are original Westinghouse and the current control panel is Schindler, which was installed in 2011 according to maintenance records. Since the building is not a high-rise, the existing building code does not require the elevators to meet current building code requirements. If replaced, new elevators would be required by the building code to meet accessible means of egress requirements, accommodate an ambulance stretcher, and be connected to standby power. Two-way voice communication at each elevator lobby would also be required.



Existing Elevator Interior (Left) and Lobby (Right)

**Recommendation:** Refinish existing elevator entrances and cab surfaces. Future replacement would need to be considered given the age of the existing elevators.

## Restrooms

The typical floor restrooms are adequately sized in order to accommodate expected plumbing fixtures. The toilet partition layout will need to be revised to accommodate ADA accessibility requirements and new partitions installed. We recommend replacing the floor, wall, and ceiling finishes.



Typical Restroom

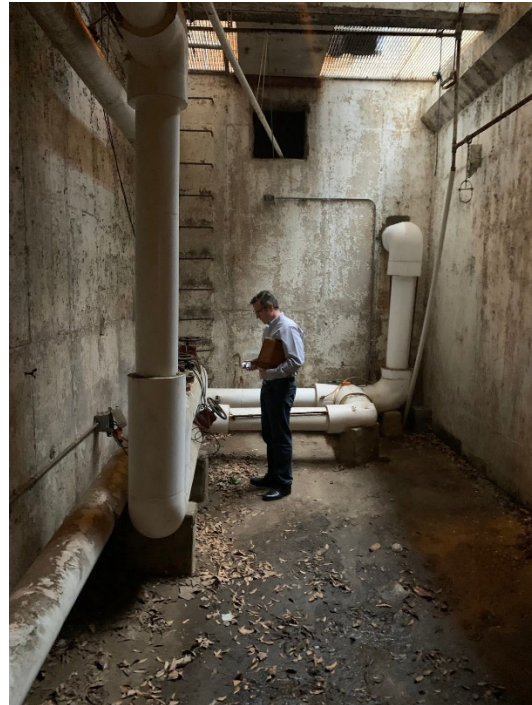
## Sub-basement

The building's sub-basement is currently damp and has visible ponding. According to the Exterior Wall Evaluation Report, dated 5/31/2011, the basement has had previous flooding issues that caused mechanical equipment damage. The flooding appeared to have entered the sub-basement through the loading dock and adjacent mechanical areaway. Several pieces of equipment in the sub-basement show corrosion damage.





Sub-basement Moisture Issues



Open Areaaway at Sub-basement Level

**Recommendation:** Provide crystalline waterproofing coating to the inside face of existing basement walls where needed. Maintain or replace sub-basement sump pit and loading dock drains to minimize water intrusion. Surface drainage should be confirmed with the Civil Engineer and Landscape Architect to ensure water is diverted away from the building.

## Interior Partitions

Interior partitions were originally constructed from gypsum block or clay brick. Later remodels used metal stud partitions. Due to their location in the building most of the metal stud partitions separating existing offices will be removed from future open areas during demolition. A high percentage of the core area walls are original, such as mechanical shaft walls, stairway enclosures, and elevator shaft walls. These walls will be more difficult to add new electrical, plumbing and low voltage systems to because of their solid construction. Damage and holes in existing fire rated walls has been observed.



Varied partition construction (left) and damaged USG Pyrobar gypsum elevator shaftwall (right).

**Recommendation:** Removal of all interior partitions except rated shaft walls and stair enclosures in order to provide a shell and core condition for leasing. Careful coordination of electrical and plumbing routes will need to be reviewed where solid gypsum or masonry walls are to remain. Plaster repair will be required at new and existing penetrations and joints. Firestopping holes, joints, and pipe penetrations will be required in existing fire rated partitions.

## Finishes

Existing terrazzo floors appear to be in good condition where visible. Some areas (Second floor lobby) appear to have been covered with vinyl composition tile and may conceal possible damage. Occasional cracks are noticeable.



The lobby has a striking marble clad elevator accent wall. It appears to be in good condition. Wood accent paneling in the lobby may be able to be repurposed but was further damaged along with other building features during protests this Fall.



Main Lobby wood wall panel damage from Fall 2020 protests (right)

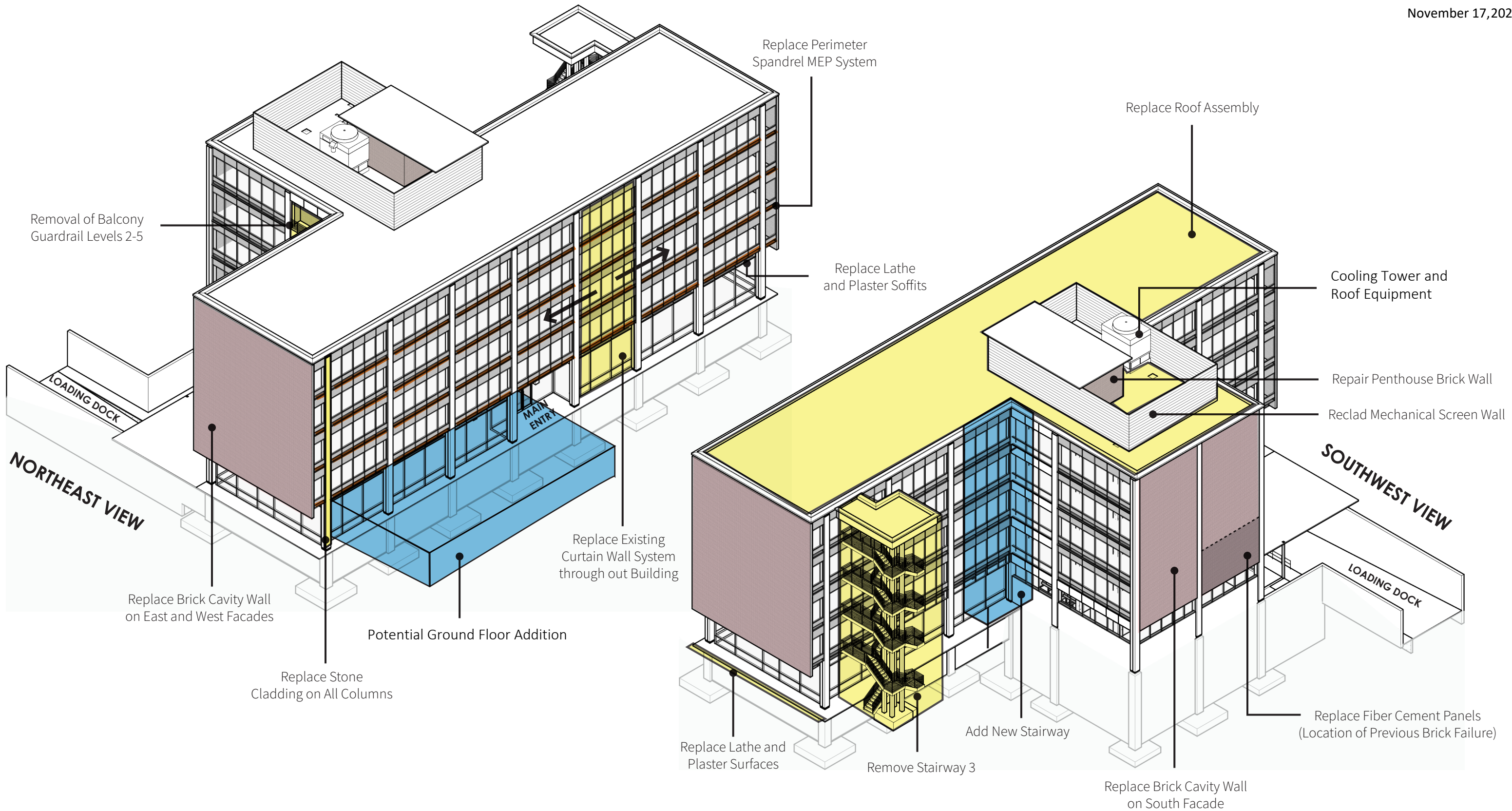
**Recommendation:** Repair cracks and clean terrazzo where possible to remain. Repurpose original wood paneling and interior stone cladding where possible.

## CONCLUSIONS

505 West Chapel Hill Street will require complete replacement of building façades, MEP systems, replacement of the roof assembly to provide the building performance and durability required of a Class-A office building. The replacement and relocation of the exterior stair is required for tenant layout and allows the building to meet egress requirements. New building envelope will be required to comply with current energy codes. Along with the curtain wall, replacing the brick and column cladding with an alternate material backed by current waterproofing strategies will be necessary to protect the building and its occupants for continued use.

On the interior, we recommend keeping a similar strategy to what the original architect intended; large open office areas with the majority of the core functions limited to the south wing of the structure.





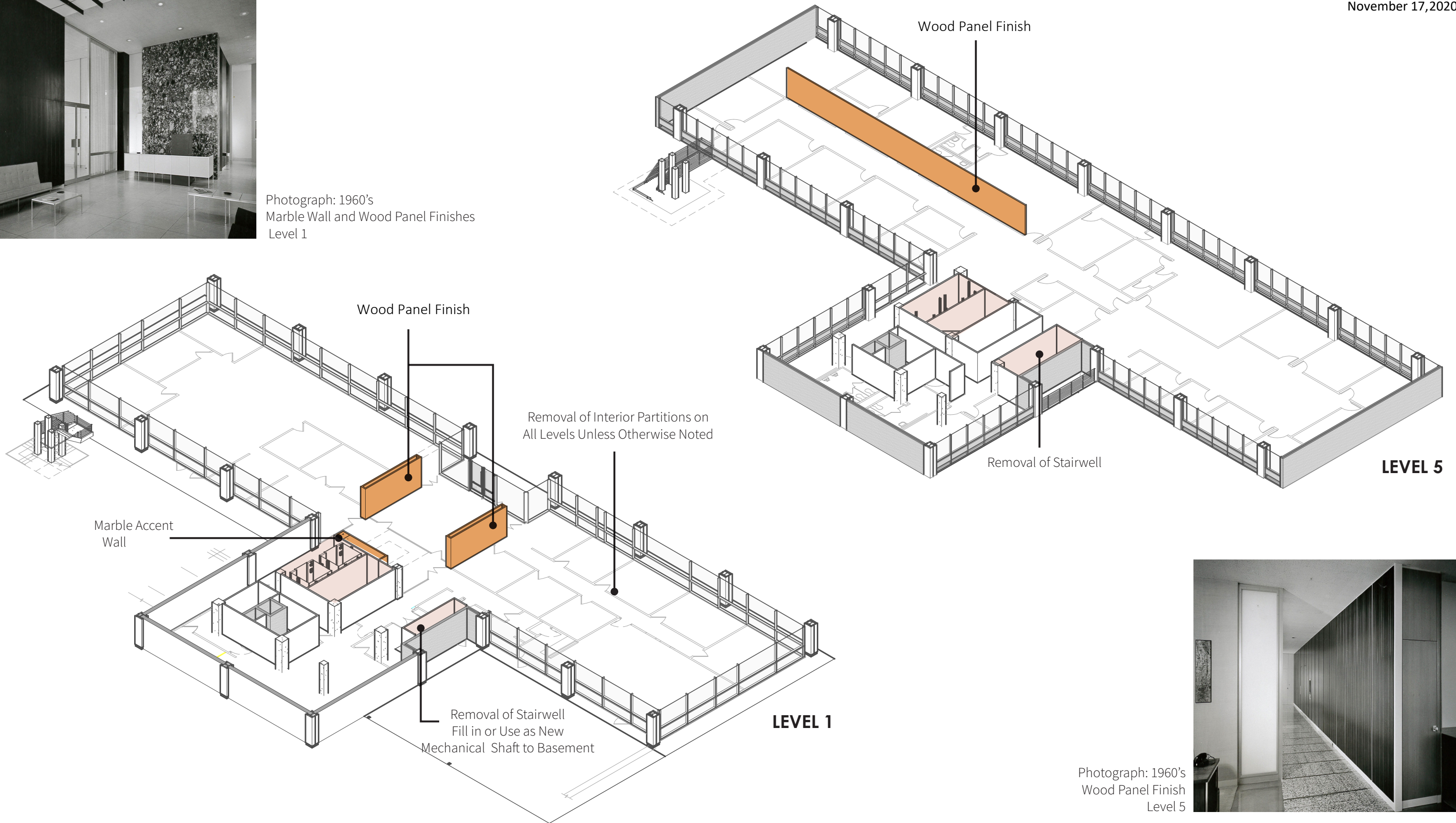
These recommendations serve as an overview of significant exterior repairs. This does not serve as a comprehensive list.

## AXON - EXTERIOR RECOMMENDATIONS





Photograph: 1960's  
Marble Wall and Wood Panel Finishes  
Level 1



Photograph: 1960's  
Wood Panel Finish  
Level 5



These recommendations serve as an overview of significant interior repairs. This does not serve as a comprehensive list.

# AXON - ARCHITECTURAL INTERIOR RECOMMENDATIONS